Law of large numbers for a class of random walks in dynamic random environments

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Abstract: In this paper we consider a class of one-dimensional interacting particle systems in equilibrium, constituting a dynamic random environment, together with a nearest-neighbor random walk that on occupied/vacant sites has a local drift to the right/left. We adapt a regeneration-time argument originally developed by Comets and Zeitouni [**?**] for static random environments to prove that, under a space-time mixing property for the dynamic random environment called cone-mixing, the random walk has an a.s. constant global speed. In addition, we show that if the dynamic random environment is exponentially mixing in space-time and the local drifts are small, then the global speed can be written as a power series in the size of the local drifts. From the first term in this series the sign of the global speed can be read off.
The results can be easily extended to higher dimensions.

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